EXHIBIT E

Case 2:22-cv-00017-RWS   Document 125-5   Filed 02/12/25   Page 2 of 21
G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 1

1   UNITED STATES DISTRICT COURT

               NORTHERN DISTRICT OF GEORGIA

2   GAINSVILLE DIVISION

3

4   SANTANA BRYSON AND JOSHUA

     BRYSON, as Administrators

5   of the Estate of C.Z.B.,

     and as surviving parents of

6   C.Z.B., a deceased minor,

7   Plaintiffs,   CASE NO.

8   vs.   2:22-CV-017-RWS

9   ROUGH COUNTRY, LLC,

10   Defendant.

11

12

13   VIDEOTAPE DEPOSITION OF G. BRYANT BUCHNER, P.E.

14   APPEARING REMOTE FROM

15   TALLAHASSEE, FLORIDA

16

17   JANUARY 23, 2024

18   11:13 A.M.

19

20

21   Reported Remotely By:

22   Judith L. Leitz Moran

23   RPR, RSA, CCR-B-2312

24

25

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 6

1   in electronic.

2   Q   Sure. One of the things that I don't

3   believe we have is the actual digital electronic

4   version of the HVE case file.

5   Have you provided that to counsel for the

6   Plaintiffs?

7   A   No, we have not. We have -- our practice

8   is to record the printed copy because the

9   electronic copy sometimes doesn't get properly

10   saved or something will happen to it.

11   In this case I'm not aware that I have

12   been able to find the original electronic copy,

13   but -- so I'm -- I couldn't get it over the

14   weekend. I wasn't here over the weekend.

15   So if we have to have it, we'll keep

16   looking, but at this point in time I don't have --

17   I don't have that exact document for you. We have

18   the -- the archived document which is the data

19   itself.

20   Q   Okay. When you say "the archived

21   document," just so I understand you have on your

22   system the original digital version of the case

23   file or is that what you're not able to locate and

24   you would just have an archive version of it

25   digitally somewhere?

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 7

1   A   Well, you said case file just there. A

2   minute ago, I thought you said the HVE file.

3   Q   Yeah, the HVE what I call case file which

4   is the original HVE file.

5   A   Yeah, I don't -- when I looked, we didn't

6   have that. We have -- we maintain the paper copies

7   of everything obviously because they can be put

8   under lock and key, but anybody on the computer

9   doing other work can, you know, move things around

10   on us from time to time.

11   So I mean, I'm not saying I don't have

12   it, I'm saying I couldn't find it when they looked

13   for it this weekend.

14   Q   Now I understand.

15   So you -- after it was originally

16   generated, you printed out hard copies of the

17   various reports that it generates and you kept

18   those?

19   A   Right. Yes.

20   Q   But you're not able to locate that

21   original HVE file that would contain all of those

22   reports in a digital format?

23   A   Not -- not as of yet, no, sir.

24   Q   Okay.

25   A   So.

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 8

1   MS. CANNELLA: Mr. Hill, what was the end

2   of that question? I couldn't hear it. The

3   original HVE file that would contain?

4   BY MR. HILL:

5   Q   All of the data and reports generated by

6   the HVE software.

7   A   Well, we -- we printed and generated

8   everything that we need or could possibly need.

9   If someone else wants something, we can

10   always re-enter it and rerun it, I don't have a

11   problem doing that.

12   I'm just telling you that what was open

13   when we hit print, we didn't find that the way we

14   thought we would and that's the electronic filing

15   issue.

16   But we can re-enter it and, you know,

17   give you that, that wouldn't be a problem.

18   BY MR. HILL:

19   Q   Sure. And when you say re-enter it, just

20   so I understand, you would need -- actually, rerun

21   the test?

22   A   Right. We would just --

23   Q   Rerun the same --

24   A   Rerun it again, yeah, to the best of our

25   abilities.

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 114

1   I had forgotten, but we did include

2   restitution. And so, all of our -- all of our

3   inputs balance with what we believed we know about

4   the accident using that .148.

5   BY MR. HILL:

6   Q   Right. And correct me if I'm wrong, but

7   when you did the HVE simulation, wouldn't there be

8   a place to input this same coefficient of

9   restitution?

10   A   Well, there's two different

11   methodologies, but, yes, you could input that but

12   it's -- it's really a -- kind of like earlier when

13   we were measuring how high the truck moved and I

14   said a quarter inch doesn't matter because you're

15   really using two different methods. It -- it

16   may -- it doesn't matter to me.

17   But you're just using a different method

18   here, another calculation method, which is -- is

19   robust.

20   So I don't want to mix my methods or

21   overvalue one above the other. I want to do them

22   independently and see what all the answers are.

23   So, but yes, someone could put that in

24   but in HVE it wouldn't quite balance because HVE is

25   looking at crush. This is not looking at crush.

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 115

1   But the answers are probably the same

2   answers, 40-miles-an-hour delta-V.

3   Q   Right. And HVE has to use a coefficient

4   of restitution in determining its crush analysis,

5   correct?

6   A   Well, yes.

7   Q   Right. And you mentioned that the

8   default coefficient of restitution that was used

9   when you first ran the simulation did not create

10   the results that you expected and you had to change

11   or manipulate that coefficient of restitution to

12   make HVE create the results that you expected; is

13   that fair?

14   A   To create the results that were measured

15   by the truck, yes.

16   In other words, HVE has never seen this

17   crash, it's just a calculation. It's -- this is

18   just a calculation.

19   Calculations are nothing but simulations

20   of reality. We never expect a calculation to know

21   what really happened in the crash, it's just a tool

22   that we use as engineers to understand it.

23   Q   Gotcha.

24   MR. HILL: Let's take that break real

25   quick. Just a short one.

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 116

1   THE WITNESS: Thank you.

2   VIDEO TECHNICIAN: The time is 1:49. We

3   are off the record.

4   (Recess taken.)

5   VIDEO TECHNICIAN: The time is 1:58. We

6   are back on the record.

7   BY MR. HILL:

8   Q   All right. I've got the -- your report

9   back up. I hope you can see it. I'm on Page 10

10   where it is entitled Crush Analysis, that section.

11   A   Yes.

12   Q   And just to make sure it's clear, this

13   section refers to your use of mathematical

14   calculations to estimate the amount of crush in the

15   hypothetical incident of a stock F250 being

16   involved in this accident; is that a fair way to

17   say it?

18   A   Yes.

19   Q   And -- and this is not really connected

20   to the simulation section below dealing with the

21   HVE simulator?

22   They're two separate ways or tools that

23   you use to try to analyze the amount of crush and

24   the hypothetical of a nonlifted stock 2016 F250; is

25   that fair?

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 117

1   A   Right.

2   Q   Okay.

3   A   The pre-lifted vehicle. If the

4   pre-lifted F250 had been in the crash, that's what

5   we mean.

6   (Deposition Exhibit 8 marked.)

7   BY MR. HILL:

8   Q   All right. And if I pull up here -- let

9   me find it. This is what is listed in your

10   materials as Crush Analysis, Bates labeled 3990

11   through 39 -- 999.

12   A   Yes.

13   Q   Is this -- am I right to refer to this

14   when I'm talking about the crush analysis you

15   mentioned on Page 10?

16   A   Yes.

17   Q   All right. And it starts here with a

18   depiction and it has the Accident Damage in red and

19   the Calculated Damage in blue.

20   And what that means calculated damage in

21   blue is what you believe the crush would have been

22   in the quote/unquote stock configuration of the

23   F250.

24   A   That's what this method calculates, yes.

25   Q   All right. And so it's approximately

Page 118

1   2.3 feet. You're saying -- what is that -- that's

2   the delta, meaning, the difference between the

3   maximum or the crush with the -- with the accident

4   itself and crush with the stock vehicle?

5   A   Yes, that's how much less crush this

6   method predicts.

7   Q   And are both of these lines following --

8   well, obviously, the blue line is using the

9   calculated method. The red line, is that from

10   actual measurements or is that also using the same

11   method of calculations?

12   A   No, that's -- that's where the crush was

13   on the car, on the Escape in the accident.

14   So the red line is what did happen, the

15   blue line is what in my opinion using this

16   methodology would have happened had the vehicle not

17   been lifted.

18   Q   Right. And if we go down to this next

19   page, 3991, is the same type of -- I don't know the

20   right word -- showing the same type of -- of change

21   in crush between the accident damage and -- and

22   this methodology of calculating crush that's on the

23   pages we're about to get to, right?

24   The same thing, this is with a Ford F250?

25   A   Okay, this is -- yes, in the calculation

Case 2:22-cv-00017-RWS   Document 125-5   Filed 02/12/25   Page 11 of 21
G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 119

1   methodology we were talking about the Ford F250

2   would have had slightly more crush, and this is

3   what it would have been.

4   Q   Right. And -- and 3992 is the

5   beginning -- 3993 illustrates how you use this

6   method to mathematically come to these conclusions?

7   A   Yes.

8   Q   That's correct, okay.

9   And we have a restitution on 3993 of 0.1.

10   Is that something that was calculated

11 based on these -- these calculations or was that

12 just input as part of the calculations?

13   A   That's input as part of the calculations.

14 So that was input.

15   Q   So what is the source of that number?

16 Why did you input .1 as the coefficient of

17 restitution?

18   A   Thought it was a reasonable value.

19   Q   Right. And it's -- it's different from

20 the value calculated with your momentum

21 calculations of .148?

22   A   Yeah, but remember the momentum was -- at

23 that point -- I -- I didn't point this out earlier.

24 The .148 is for the accident when the hatch was hit

25 and we're trying to balance out what did happen in

Page 120

1   the accident.

2   So it's not representative of what we did

3   in EDSMAC or the engine dynamics or in the other

4   calculation because this is -- this is, you know, a

5   -- the accident condition which is not what we're

6   trying to model in the other calculations. We're

7   trying to model a bumper-to-bumper-type hit.

8   Q   So you used an estimate of the difference

9   in the coefficient of restitution if only the

10   bumper was impacted of .1? And that was just

11   your --

12   A   That's correct.

13   Q   -- kind of reasonable value?

14   A   Yeah, not only the bumper because other

15   things will hit, but yeah, the .1 is what I -- what

16   I used for the stock truck hitting a stock Escape.

17   Q   And in your calculations here under the

18   stock you're assuming that there will be no bumper

19   override in this hypothetical impact?

20   A   I'm not assuming it, I'm -- I'm

21   concluding it as an engineer based on what I know

22   about the accident. But, yeah, I don't believe

23   there is going to be any.

24   Q   And you're concluding it based upon what,

25   just the heights of the two bumpers, based upon the

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 127

1   crush on the Escape sometimes we're just recording

2   from the back hatch because that's what crushed in

3   and -- and stopped the truck. The bumper and

4   everything went down and got bent up.

5   So this is just reminding us that it's

6   about 5 inches from the back hatch to the bumper

7   itself.

8   Q   And when you say 5 inches, explain that.

9   When you say -- you mean the bumper protrudes

10 beyond the hatch about 5 inches?

11   A   Yes.

12   Q   Okay. And this is -- again, you used the

13 2010 information from AutoStat?

14   A   It's the same as -- it's the same as '08,

15 yes. It's -- yeah, it's -- all this data is for

16 that year range of vehicle.

17   I just happened -- or I didn't -- the

18 staff engineer that did this happened to print the

19 2010, but it's the same information as the 2008.

20   Q   And it has a weight distribution for the

21 Escape of 57 percent on the front and 43 percent on

22 the back; is that correct?

23   A   Yes.

24   Q   That relates to the overall weight or is

25 that the curb weight on the axis?

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 128

1   A   Both. The -- 57 percent of the curb

2   weight will be on the front axle and 43 percent

3   will be on the rear axle.

4   Q   And did you use that same distribution

5   when using the HVE simulation?

6   A   Yes.

7   Q   All right. And then for the -- this is

8   just -- this page just has the information on the

9   Escape. Did you use this same type of information

10   for the F250?

11   A   Yes.

12   Q   All right. That's -- I don't see that

13   included with your crush analysis. So is there a

14   page missing from this or --

15   A   No, the -- the specs are in the file.

16   For some -- when we're doing the crush analysis, we

17   want to remind ourselves about the difference in

18   5 inches. That's what's highlighted here.

19   That wasn't important for the truck

20   because it used its bumper on everybody.

21   The weight percentages are in another

22   part of the file, they just happen to also be on

23   this page.

24   Q   Okay. And tell me again the significance

25   of reminding yourself of the 5 inches.

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 155

1   Q   When you say "match the download," just

2   so I understand that, what actual data from the

3   F250 download are you trying to match in running

4   the HVE stimulator?

5   A   The impact speed and the exit speed.

6   Q   Right. Any other data you're trying to

7   match?

8   A   No.

9   Q   Okay. So you basically change around the

10   coefficient of restitution until you max those

11   speeds, and then that's what gives you confidence

12   that you've got the proper inputs from the HVE

13   simulation?

14   A   Well, we -- you know, we -- we work on

15   the vehicle itself, geometry, and all of that.

16   We're not talking about that.

17   From a calculation perspective, yes, we

18   use -- we -- we put in the crush stiffness

19   coefficients, which we've talked about.

20   Q   Right.

21   A   And then we put in the impact speed and

22   then we vary the restitution or what's also called

23   the relaxation in that particular program to

24   produce the 17.92 delta-V, I believe it is, or

25   17.93. Yes, that's -- that's all we're doing.

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 156

1   We're letting the program do its thing,

2   but we're giving it a little bit of guidance.

3   Q   If you have the program, how -- how does

4   that DyMESH algorithm work?

5   Do you know how to explain it in -- like

6   if you have to explain it to the jury, I'd love to

7   hear what your explanation will be for how that

8   algorithm works.

9   A   Okay. Well, as I said earlier, it's

10   based on crush stiffness coefficients that are

11   derived standardly by measuring damage at bumper

12   level.

13   But then this particular algorithm looks

14   at the -- at the whole surface of the front of the

15   vehicle and -- and tries to do -- take into account

16   all of the forces.

17   So it actually discounts those AV values

18   and more or less spreads them out across the front.

19   And then it's just going to do some of

20   the forces between the -- the back of the Escape

21   and the front of the truck and it's going to say

22   that the forces are always balanced.

23   And it's going to determine those forces

24   from the AV values, which are the strength.

25   But it's also going to use the geometry

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 178

1   MS. CANNELLA: Okay.

2   A   So --

3   MS. CANNELLA: I don't know.

4   A   Let's just -- let me make sure to listen

5   to the question. I thank you. If we could try

6   that last one again because I might have heard it

7   wrong.

8   MR. HILL: Well, that's something we need

9   to clear up.

10   Thank you, Tedra.

11   BY MR. HILL:

12   Q   Is there a difference between crush

13   stiffness coefficient and coefficient of

14   restitution?

15   A   There absolutely is.

16   Q   Okay.

17   A   So the crush stiffness coefficients have

18   to do with the inherent strength of the vehicle.

19   And then the coefficient of restitution

20   has to do with the rebound or somewhat -- or the --

21   more or less a way -- the plasticity or elasticity

22   of the vehicles as they combine and hit each other.

23   So one is -- one is kind of the

24   springiness and the other is the strength.

25   Q   So when we're talking about stiffness

Page 179

1   coefficients, we're talking about strength?

2   A   Yes.

3   Q   Okay. And what version of HVE did you

4   use, do you know?

5   A   It's a -- it's a recent -- I think the

6   purchase of this was last year, so it's a recent --

7   if the output doesn't tell it to us on top, I don't

8   know off the top of my head. Let me look and see.

9   Q   17.00.

10   A   That looks right.

11   Q   And that's from 2021?

12   A   Yes, sir.

13   Q   All right. And are there any new

14   versions of it come out since 2021 that you're

15   aware of?

16   A   Not that I'm aware of.

17   Q   Okay. And are you saying that there was

18   no like database of stiffness coefficients for a

19   2016 F250 contained within the HVE database?

20   A   We didn't find one when we looked, no.

21   Q   Okay. When you -- so you inputted the

22   one you got from Neptune. And was that stiffness

23   coefficient specific to any side of the F250?

24   A   It -- it was a frontal, yes.

25   Q   Okay. So you used the frontal one from

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 181

1   I appreciate your helping me.

2   Now, does the -- does the center of

3   gravity play any role? Is that something you have

4   to input for each vehicle?

5   A   The center of gravity is input and it

6   plays a very minor role. As long as you're even

7   reasonably close, it -- it doesn't have an effect.

8   Now, in this particular crash. In

9   others, it can. Let's say you've got really an

10   angled crash way off and it went in.

11   So in this case it is put in and then

12   it's -- it's left where it is in the -- in the

13   stock vehicles.

14   Q   Okay. So -- so when you say it -- it is

15   put in, is it put in by you, the user?

16   A   Yes, based on those weights or the specs

17   that you have that we looked at earlier, that's --

18   the CG is determined by those weights and its

19   location and that's what's in the program after we

20   put it in.

21   Q   Right. And that's -- that's kind of my

22   question, because in the HVE simulation the Escape

23   had a distribution of 60.6 percent to the front and

24   39.4 percent to the rear.

25   Is that something that HVE automatically

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 182

1   input or is that something that you guys input?

2   A   I'd have to go back and look on this

3   particular run. You can put occupants in and then

4   it'll make the adjustments which is fine.

5   Sometimes we put it in ahead of time.

6   With those numbers you're telling me, it

7   looks like we were accounting for occupants near --

8   near the front wheels and the rear wheels.

9   So my memory isn't perfect on that, but

10   you -- but if -- even if we left it at the original

11   57/43, it would not change the answer in this

12   particular case.

13   But it does look like -- the numbers

14   being a little bit different, it looks like that --

15   that either we or the program actually put the

16   people in the front seat. So it -- you have a

17   little more weight on the front.

18   Q   And so that 3 percent extra you would

19   attribute to the front seat occupants?

20   A   Yes, because they're -- they're sitting

21   closer to the front wheel so it adds a little bit

22   of weight towards the front.

23   Q   Right. And how did you determine the

24   weight of the front seat occupants? Did you have

25   medical records or something from them or what?

G. Bryant Buchner , P.E.   January 23, 2024
Bryson, Santana and Joshua v. Rough Country, LLC

Page 235

1   C E R T I F I C A T E

2   Deposition of: G. BRYANT BUCHNER, PE

          Date of Deposition: JANUARY 23, 2024

3

4   STATE OF GEORGIA:

5

6   I hereby certify that the foregoing

7   transcript was stenographically recorded by me

8   via Zoom as stated in the caption. The deponent

9   was duly sworn to tell the truth, the whole truth,

10 and nothing but the truth. And the colloquies,

11 statements, questions and answers thereto were

12 reduced to typewriting under my direction and

13 supervision and the deposition is a true and

14 correct record, to the best of my ability, of

15 the testimony/evidence given by the deponent.

16   I further certify that I am not a

17 relative or employee or attorney or counsel to

18 any of the parties in the case, nor am I a

19 relative or employee of such attorney or counsel,

20 nor am I financially interested in the action.

21   This, the 1st day of February 2024.

22

23

24   Judith L. Leitz Moran, CCR-B-2312

          Registered Professional Reporter

25